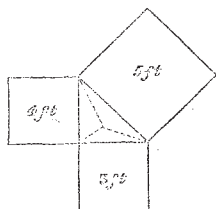


have before us five slips. The first addressed "To the Scientific of University College, London, 1871. The Curve a Progressing Wheel Curve. A wheel four feet diameter with a nail in its rim : when traversing forward, the nail will form a curve, and much longer than the circumference of the wheel. Query : How much longer ? and what must be the DIAMETER of a circle—for a part of the said circle to SHOW THE SAID CURVE ?" And then there follow two other geometrical questions, the one to



divide a trapezium into two equal parts. On the back is pasted (all in writing) : "A Problem within a Problem. History record (*sic*) Pythagoras discovered the demonstration of the three squares to surround a Right Angle Triangle ; the Two smallest when added together to equal the largest of twenty-five square Feet. I ask to find the Dimensions to demonstrate the Three Triangles dotted out into proportionally unequal parts, that when added to each square they produce the same result ; viz. Two to equal the largest Figure.

"N.B.—From the Figures 3, 4, and 5, They can be wrought perfective."

Dated Oct. 2, 1871.

So far there is not much harm in J. D. H.

Another slip addressed, in ink, "To University College, London," is a bit of Hailesian Astronomy, and is, "Astronomy is Paradoxical." The N.B. is of interest in the light of the recent Transit Expeditions. "Those Transit of Venus measurers that try for the distance of the sun by Paradox, are in error. Let them try to find the distance by demonstration. I say it can be done." The back of this page is devoted to "Astronomy and Longitude," and opens with the following doggerel :—

Science the Lock of Bible Truth, all the Works Divine,
Magnetic Key, unlock the Truth, and give true Mean Time.
In the Time of Joshua the Sun stood over Gibeon, the Moon
over Azalon ;
It was at the Summer Solstice, 2548 from Adam, DISPROVE WHO
CAN ?

The Sun began to go back on the Dial of Ahaz at 40' past Noon.

This last line is in ink. We have then a rule to find true longitude at sea by time, sun, and moon. The spelling is a caution, and the calculation a fitting companion. This is dated Oct. 16th, 1870 ; the former page Oct. 6th, 1871. Our last document from Mr. Hailes was sent to the British Association, 1868, and is entitled "My Calculated Time of Christ's Crucifixion, A.D. 30," with a number of dates : "And now I challenge all the astronomers in the world justly to dispute my above-given times for the above-given events." Verily, Mr. J. D. H. believes wisdom will die with him. Stand down ! you will not do much harm, Mr. Hailes.

Mr. W. Upton, B.A. (B. of P., pp. 256-258) brought out in 1872 (E. and F. Spon), "The Circle Squared : Three famous Problems of Antiquity geometrically solved—1. The Quadrature or Circle Squared. 2. Diameter definitely expressed in terms of the circumference. 3. The circumference equalised by a right line. The whole rendered intelligible for arithmeticians as well as for geometers, and adapted for the higher classes in schools of both sexes, private students, collegians, &c." We think the day is not very near at hand when this subject will occupy the minds of schoolboys ; the present generation have enough to do to secure time for the study of the elements in the "Conflict of Studies" which is being now waged. Mr. Upton, if now living, must be in his 83rd year, and can hardly be expected to write much more on this subject. In his preface he acknowledges to previous failure with respect to the trisection, "but has it now complete." (De Morgan demolished his former essays ; one we have seen appears to depend upon a

construction familiar to practical geometers. The neatest of practical methods we believe to be that hit upon by J. J. Sylvester, F.R.S., recently referred to in the columns of NATURE.) His aim (in the quadrature) has been at practical utility, not rigidly subject to all the extreme niceties of mathematical strictness. The more general treatment he has not gone into on account of the expense (he has not apparently the purse of a James Smith or a "Kuklos") He pledges himself to the satisfactory fulfilment of all that the following advertisement sets forth :—

"1. The full development of the Quadrature, analytically and synthetically, in its threefold aspect—arithmetical, geometrical, and trigonometrical ; containing—2. The so greatly coveted and despaired of desideratum of equalising a circular segment by a rectilinear figure, which determines at once the complete solution of the Quadrature. 3. An appendix, with diagrams, &c." All this to be published on or before Jan. 1, 1873, or much sooner if a sufficiency of early subscription warrants it. This work we have not seen ; we infer, then, that there were not found eighty subscribers of sufficient faith in Mr. Upton's word and sufficiently interested in the question to come down with the requisite 3s. 6d. each. What an opportunity for a liberal-minded man ! A trifle of 14% in the one scale, and in the other a vexed question set at rest. Nor is this all ; he could, too, satisfactorily account for the real origin and inspired nature of mythology, but for the present he confines himself to the more immediate subject. "Certain Hebrew letters and Greek mythology, nay, even Scripture itself, seem to bear distinct allusions to matters touching upon the origin of the square and circle." He winds up with a singular excursus upon the Hebrew "distinctly representing the square and circle ; the level line answering for base of the one and diameter of the other ; the perpendicular for the adjoining side of the square ; and the curve for a quadrant of the circle : each with an appearance of string at the extremity to intimate its being carried on to completion." There is a "Supplement" (diagram and five pages, free of charge), from which an estimate of the value of the work may be got on the author's own showing : "The precise difference is therefore not equivalent to the impression of a pin's point ; so that the author considers himself fully justified in looking upon the two areas as arithmetically equal. Moreover, in a geometrical solution, which is the real object of the problem, it is evident that so invisible a difference can have no possible effect."

Again, if he should be enabled to publish his proposed treatise, he can "show by three or four distinct but concurrent proofs that the circle itself not only admits of, but—more surprising still—actually suggests the formation of a right-lined figure equal in area to the circular segment belonging to each quadrant ! This is what may indeed be esteemed as the true secret, the virtual key of the Quadrature ; which the author will give to his readers and apply for them in the annexed diagram. He would have reserved the fact till he could have given it with the several proofs complete. But, as the fact itself, and its application to the diagram, ought to prove sufficient to produce conviction as to the truth of his assertion, he will proceed to apply it without further preface." We gather from his remarks that they turn upon the lengthening of a line by a point from a pencil which can make no perceptible difference in the geometrical construction. It seems only necessary to make this statement, and leave our mathematical readers to draw their own conclusions therefrom. (To be continued.)

INTERNATIONAL METEOROLOGY*

IT may be truly said that all the large questions which fall within the province of meteorology can only be adequately discussed by data collected in accordance

* Report of the Permanent Committee of the First International Congress at Vienna, for the year 1874. Printed by authority of the Meteorological Committee. (London : Stanford, 1875.)

with some well-devised scheme of international observation. What is required is the means of giving an accurate general representation of atmospheric pressure, temperature, humidity and aqueous precipitation, together with the movements of the air as indicated by the direction and force of the wind, and of the phenomena more immediately connected with these movements. Of these last, the more important are clouds, their species and motions, and electrical and auroral manifestations.

These large inquiries naturally fall into two groups. The first group is concerned almost exclusively with the great movements of the atmosphere, and it is the adequate investigation of these inquiries which is aimed at by the United States Government in their great scheme of observations made at the same *physical instant* over the whole globe. This scheme may be called *cosmopolitan*.

The second scheme may, in contradistinction to the above, be called *international*. It includes those inquiries which deal with the large and vitally important subject of comparative climatology, or a comparison of the climates of different countries and regions, and of their meteorology generally, inclusive of the great movements of the atmosphere over a restricted portion of the globe, such as the United States, the North Atlantic, or Europe. It is altogether essential to the discussion of those inquiries which fall under this head that the observations be made at the same *local time* and with instruments so constructed and placed as to give results strictly comparable with each other. It is evident that the exposure of the thermometers, including their immediate surroundings and height above the ground, must be uniform in all countries; otherwise the observations, being incomparable, cannot be used in questions of international meteorology.

Of the recurring meteorological phenomena which first and most imperatively require to be dealt with internationally, both from their importance in atmospheric physics and from their intimate bearings on animal and vegetable life, are the daily changes which take place in the temperature, humidity, pressure, and movements of the atmosphere from 9 A.M. to 3 P.M. With observations at these hours, together with the daily maxima and minima of temperatures from a network of stations well spread over Europe, we should be put in a position of being able to inquire, with some hope of success, into the influence exerted on meteorological phenomena by different latitudes and elevations; by the Baltic, Caspian, Black, Mediterranean, and Adriatic Seas, the English Channel, and the Atlantic; and by the Swiss Alps, the mountain ranges of Great Britain and Norway, the scattered hills of Ireland, the elevated plateaux of Spain, and the extensive flats of Germany and Russia. We entirely concur with Prof. Plantamour in thinking that during recent years the study of the movements of the atmosphere has been too exclusively directed with a view to the application of the results to the prediction of storms on the coasts and to the system of storm-warnings, and that other points of view have been completely abandoned (Report, p. 58). It is right, however, to add that this neglect may be excused on the ground that, as there is an entire want of uniformity in the hours and modes of observing in the systems of meteorology as pursued in the different countries of Europe, the data for the investigations of nearly all the important questions of international meteorology do not exist.

It was a widespread feeling of a requirement of uniformity of procedure in the prosecution of meteorological researches in different countries which led many to look to the Congresses of Leipzig and Vienna as likely to secure this result; and it is a matter of regret that at these meetings nothing was done to bring about uniformity in the hours and modes of observing. Doubtless the question of international observations was under discussion at Vienna, but the feeling of the delegates regarding it, as indicated by the state of the vote and the large

number who abstained altogether from voting, was such that the only resolution arrived at was this, viz.: "That the best form of publication for the stations selected for international objects should be determined by the Permanent Committee, after consultation [*nach Anfrage*] with the directors of the central institutes."*

The matter accordingly came before the Permanent Committee at their meeting at Utrecht in September 1874, and after numerous explanations and a long discussion they unanimously resolved on a form for the publication of observations made for international objects (p. 7). This resolution is now being carried out by several of the countries represented at the Vienna Congress.

With reference to this resolution, however, it is to be remarked that (1) no provision was made by it for the observations being made at the same hours of the day; and as a matter of fact, the observations in the British Isles in connection with the scheme are 9 A.M. and 9 P.M.; in Russia, 7 A.M., 1 P.M., and 9 P.M.; in Norway, 8 A.M., 2 P.M., and 8 P.M.; in Italy, 9 A.M., 3 P.M., and 9 P.M.; in Austria, variously, and so on.

(2) No provision was made for securing uniformity as regards the vital question of the exposure and position of the thermometers, without which comparability is impossible.

(3) The forms adopted, both for the daily observations (p. 10) and for the monthly results (pp. 47-50) are in several respects defective, inasmuch as they do not include some of the more important data required in international inquiries.

The result will only be the printing of various sets of observations styled international, but which are not international—being, in truth, taken at their very best, merely national. By observations so made, no international question of meteorology can be satisfactorily discussed, and many international questions of the first importance, both practical and scientific, cannot even be attempted to be discussed.

When the subject was before the Vienna Congress, Plantamour urged the necessity of drawing a distinction between observations referring to the special study of the climate of each country, and those which are intended to indicate the simultaneous condition of the atmosphere over the whole surface of the earth (Report of Vienna Congress, p. 35). Until this be done, or until some such scheme as we have here indicated has been considered and agreed upon, it would be a mistake in meteorologists co-operating in carrying out a scheme which, while called international, completely fails to furnish the data required for international inquiries.

The only wise course the Permanent Committee can take at their next meeting is to rescind this resolution, as they have already virtually rescinded (p. 8) the resolution regarding rain-gauges all but unanimously passed at Vienna; and after consideration of the whole question to make provision that the instructions given them by the Vienna Congress with regard to this matter be carried out, viz., that no resolution be come to till after they have consulted the directors of the central institutes of the different countries; by which means they will furthermore be put in a position to propose a scheme which has been well matured, and therefore of such a character as will enlist in its behalf the general co-operation of meteorologists.

NOTES

WE can only this week join in the universal expression of regret at the death of Sir Charles Wheatstone, which took place at Paris on the 19th inst., at the age of seventy-three years. Inflammation of the chest was, we believe, the immediate cause of the sad result. The Paris Academy showed the greatest

* Protocol of the Ninth Meeting of the Congress.